ENSMS – Annual Performance Report

2016 – 2017

31st August 2017

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1. Annual Compliance Reporting

This report provides general information about the performance of TransGrid's Electricity Network Management System (ENSMS) as implemented in accordance with the *Electricity Supply (Safety and Network Management)* (ESSNM) *Regulation 2014* and Australian Standard AS 5577[1]. It has been produced in accordance with IPART's Electricity Networks Reporting Manual Annexure 1 – Annual Performance Report.

In the 2016 – 2017 financial year TransGrid continued to maintain its ENSMS and supporting Management Systems to meet the requirements of the ESSNM Regulation. TransGrid's ENSMS defines the interface and integration of the various corporate frameworks and management systems that implement risk controls to ensure that the ENSMS objectives are met. TransGrid is committed to delivering the following objectives through its ENSMS:

- the safety of members of the public;
- the safety of person(s) working on the network;
- the protection of property (whether or not belonging to a network operator);
- the management of safety risks arising from the protection of the environment (for example, preventing bushfires that may be ignited by network assets); and
- the management of safety risks arising from the loss of electricity supply.

TransGrid's ENSMS is supported by the following Management Systems:

- A Health and Safety Management System certified to AS/NZ ISO 4801;
- An Asset Management System certified to ISO 55001; and
- An Environmental Management System certified to ISO 14001.

During 2016 – 2017, TransGrid did not record any incidents (safety, environmental or reliability) that met IPART's definition of a "major incident".

1.1 Safety and reliability of the network operator's network

1.1.1 Programs and activities undertaken to maintain or improve the safety and reliability of the network operator's network

TransGrid initiated the following new worker safety programs and activities in financial year 2016 – 2017. These safety programs and activities are above and beyond TransGrid's business as usual activities. These new programs are targeted to enhance safety culture and continually improve TransGrid's control of the key hazardous events nominated in TransGrid's ENSMS.

- **System:** TransGrid initiated three programs, namely – Mobile Plant Framework, Work and Safety Package Construction (WASP), and WASP Maintenance. These programs are part of the safety process that covers the planning, performing and monitoring of operations where TransGrid is the manager or controller of the worksite.
- **Leadership:** Preparation for safety focused leadership training was initiated for selected front line asset facing personnel to articulate safety responsibilities on site. TransGrid expects 81 staff to be trained through this initiative.
- **Organisational Behaviour:** TransGrid initiated the Heads Up Safety Conversation program in 2016 – 2017. Training for observers was completed for the roll out of this program.
- **Resourcing:** Refinement of the Capabilities Framework was initiated in 2016 – 2017.
- **Knowledge Transfer:** TransGrid initiated the following four knowledge transfer programs:
  - Preparation for the inter-regional HSE knowledge collaboration;

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- Linking of local asset data in TransGrid's asset systems to provide and share hazard information more widely across the business;
- Securing approval to introduce new communication mediums in toolbox talks; and
- Attending third party project toolbox meetings for its key HSE staff to get exposure to other organisational practices.

- **HSE Requirements:** TransGrid simplified the information presentation in the HSE section of the WIRE (TransGrid internal web portal) to assist staff to locate specific guidelines and instructions.

Network reliability is managed across the asset lifecycle to deliver value to the consumer and to manage safety risks arising from the loss of electricity supply. TransGrid's network reliability has continued to be strong, with no major reliability events and three reliability incidents (as defined in IPARTs reporting guidelines) being recorded in 2016 – 2017. This is below, and therefore better, than the long term average level for network performance.

In the reporting period TransGrid assisted in the reliability standard setting process, so that a widely consulted and accepted reliability standard could be determined. This resulted in a new NSW electricity transmission reliability and performance standard being released by IPART in December 2016.

TransGrid is presently participating in the consultation process to determine the best methodology to assess compliance to the electricity transmission reliability standards, adopted by the Minister for Industry, Resources and Energy in 2016 – 2017.

During 2016 – 2017 TransGrid applied its Network Asset Risk Assessment Methodology to determine an efficient capital spend for the upcoming 2018 – 2023 regulatory period. The application of this methodology allows TransGrid to calculate the current and future effective age of individual network assets, and the effective age and probability of failure profile for each network asset class. This probability of failure is combined with output from the Network Asset Criticality Framework, which describes the consequences and likelihood of consequences for all asset failures. This work supports the demonstration that TransGrid's forward capital program will meet the ENSMS objectives.

TransGrid has reviewed and enhanced its Prescribed Network Capital Investment Process to ensure the most efficient use of capital funds to manage risks on the network and ensure the greatest benefit for consumers. This is an important control to make sure that investment is allocated consistent with the objectives of the ENSMS.

Table 1 Non-compliances relating to the safety and reliability of the electricity network

Identified non-compliances	Actions against non-compliances	Progress of actions
0	0	0

1.2 Advice to the public about hazards associated with electricity in relation to the network operator's network

1.2.1 Programs and activities undertaken to promote the public knowledge and understanding of electrical network safety hazards

TransGrid continued delivering public electricity safety awareness programs in financial year 2016 – 2017 on top of its usual project engagement activities. These programs provide safety advice to the public promoting knowledge and understanding of electrical network safety hazards through community engagement, advertising, and media relations. These programs are targeted to a broad public spectrum ranging from school children to communities in regional areas on the basis of the key hazardous events identified in TransGrid's ENSMS.

- **Community Engagement:** TransGrid's "BeSafeKids" program targets schools where TransGrid are actively working in the community, either building new assets or upgrading existing assets. The program consists of two elements – a classroom presentation focussing on electricity safety and safe behaviour, and a field trip to a nearby TransGrid asset or an environment activity such as planting trees at the school. In 2016 – 2017 TransGrid conducted BeSafeKids sessions in Taree and Tinonee on the NSW Mid North Coast. TransGrid also sent out invitations to greater than 100 schools across areas including Dapto, Oak Flats, Albion Park, Tumut, Bathurst, Parkes and the Australian Capital Territory.
- **Advertising:** In June 2017 TransGrid conducted a month-long print media advertising campaign focussed on public electrical safety awareness in the Australian Capital Territory. Advertisements appeared weekly in The Canberra Times and Canberra Weekly, with a combined total readership of more than 190,000 per week. These advertisements reinforced safety messages about conduct around TransGrid's assets in and around the ACT along with general electricity safety messages.
- **Media Relations:** In September 2016 TransGrid conducted a regional media campaign to support the organisation's annual aerial patrols of the transmission overhead lines for bushfire risks. During this campaign a media release was distributed to print and broadcast media in affected regions (Riverina, Hunter Valley, Mid North Coast, New England, Northern Rivers and Southern Highlands) outlining the need for bushfire risk assessment and reminding community members to maintain safe practices around transmission towers and substations.

1.3 Management of bushfire risk relating to electricity lines and other assets of the network operator's network that are capable of initiating bush fire

1.3.1 Programs and activities undertaken to maintain or improve the management of bushfire risk associated with the network operator's network.

TransGrid revised the Formal Safety Assessment (FSA) in 2016 – 2017 pertaining to bushfire risk management as per the IPART notice of direction noted below.

Table 2 Non-compliances relating to the management of bushfire risk associated with the electricity network

Non-complaint audit criteria	Actions against non-compliances	Progress of actions
1. Formal Safety Assessment(s) (FSA) exist that identify risks (external and arising from the network), analyse (likelihood and consequence) and evaluate bushfire risks (differentiates higher risks) against acceptance criteria (Clause 7 of ESSNM Regulation and Section 4.3.2 of AS 5577). 2. Evidence that bushfire risks are being eliminated or at least reduced to "as low as reasonably practicable" (ALARP) (Clause 7 of ESSNM Regulation and Section 4.3.2 of AS 5577). 3. Bushfire risks are assessed for foreseeable abnormal circumstances or during significant disruption to normal operations, including	> TransGrid further developed the FSA as per the notice issued by IPART on 30 September 2016. This addressed non-compliances 1-3. > TransGrid developed processes and procedures to implement the FSA and to address remaining or previously identified non-compliance on 31 March 2017. This addressed non-compliance 4.	> FSA was independently audited by external auditor and the findings were reported to IPART on 31 October 2016. > Underlying safety management system processes and procedures to support the implementation of the FSA were independently audited by an external auditor and the findings were reported to IPART on 30 April 2017. Items 1-4 were closed out. > TransGrid has implemented the amended ENSMS pertaining to bushfire risk management with regard to identifying, prioritising and rectifying defects with an aim to demonstrate bushfire preparedness status. This will be confirmed through an audit in October 2017.

Non-complaint audit criteria	Actions against non-compliances	Progress of actions
emergencies (Clause 7 of ESSNM Regulation and Section 4.3.3 of AS 5577). 4. The asset management system allows for adequate maintenance and monitoring of assets associated with bushfire risk (Clause 6 of ESSNM Regulation).		

1.3.2 Bushfire risk management report

TransGrid's 2015 – 2016 (i.e. the previous annual reporting year) Bushfire Risk Management report is publically available on its *website www.transgrid.com.au*. This report covers the annual 1 October 2015 to 30 September 2016 and was prepared in accordance to the ESSNM 2014 Regulation Clause 10 and IPART Electricity Networks Reporting Manual Chapter 4 and Annexure 2.

2. Contextual Information

2.1 Deviation from standards

TransGrid maintains various management systems and follows the business processes and procedures established within its systems for all its organisational functions. Adherences to these systems are ensured by a three line of defence approach incorporating:

1. Compliance Risk Owners – Business Units, Groups and teams;
2. Independent review and challenge - Management System reviews and Corporate Risk oversight; and
3. Independent assurance – Corporate internal and external 3rd party audit.

Any identified deviation is raised and escalated appropriately within the management structure for appropriate action.

TransGrid maintain and use substation and transmission line and cable Standard Design Manuals and Standard Construction Manuals, each of which references internal standards, Australian standards, international standards such as IEEE and IEC, national or international codes, and industry guidelines to plan, build, commission, operate, maintain and decommission its transmission network assets.

TransGrid also follows Safety in Design, HAZCON and HAZOP process for all works in compliance with the WHS Act 2011. In 2016 – 2017 TransGrid did not deviate from any established standards, codes and guidelines as detailed in Table 3.

Table 3 Deviations from standards

Deviation description	Justification
0	NA

2.2 Significant community infrastructure

TransGrid operates and manages the high voltage electricity transmission network in NSW and the ACT and supplies electricity to four distribution network service providers (DNSPs). TransGrid's network supplies electricity to more than 3 million homes, businesses and communities in NSW and ACT. TransGrid transports electricity from generation sources such as wind, solar, hydro, gas and coal power plants to large directly connected industrial customers and the four DNSPs that deliver it to homes and businesses. Comprising 100 substations, approximately 13,000km of high voltage transmission lines and cables and five interconnections to Queensland and Victoria, TransGrid underpins economic growth and facilitates energy trading between Australia's largest states.

TransGrid considered the guidance and examples provided in the IPART Electricity Network Reporting Manual Annexure 1 Section 2.2 and notes that it does not classify individual loads as significant community infrastructure in the manner described. Given the scale of TransGrid's operations, and the potential impacts, all assets are considered critical infrastructure.

TransGrid's business practices and its asset management system work to assess the criticality and mitigate the risk from its network assets and to ensure that the risk to health and safety, network reliability and bushfire are managed to as low as reasonably practicable (ALARP).

3. Formal safety assessment reviews and residual risks

3.1 Classification of risk levels

The TransGrid Risk Matrix classifies risks into Extreme, High, Medium and Low ratings which are qualitatively measured by using a defined range of Likelihood (Almost Possible, Likely, Possible, Unlikely, and Rare) and a defined range of Consequences (Catastrophic, Major, Moderate, Minor, and Insignificant). These ratings are detailed in TransGrid's Enterprise Risk Management (ERM) Framework document.

The ERM Framework requires mandatory treatment plans for risks rated Extreme and High risk ratings to mitigate the risk to an acceptable level. The Board is responsible for defining TransGrid's strategy and approving the Risk Appetite Statement (RAS), which reflects the Board's expectation on the level of risk that is acceptable. The RAS accepts that all risk cannot be eliminated, and that a High risk rating will be acceptable only if the risk has been reduced to as low as reasonably practicable. This aligns with the principles of AS 5577.

3.2 Risks within the scope of the ENSMS

TransGrid's Enterprise Risk Management (ERM) Framework follows the AS/NZS ISO 31000:2009 Risk Management – Principles and Guideline and provides an integrated and structured approach to managing risks within the risk appetite established by the TransGrid Board. The ERM Framework provides guidance on the roles and responsibilities expected of the Board, management and staff when escalating, managing and treating risks as they arise. Risk priorities are cascaded down from the strategic level, to the business unit levels and project levels.

The following strategic risks are addressed in TransGrid's ENSMS:

- Bushfire risk;
- Safety risk (both public and workers); and
- Network Reliability risk.

3.3 Reviews of formal safety assessments

In developing the ENSMS and planning for safe operation, TransGrid in 2016 – 2017 revised its FSAs with respect to network related safety risks, in accordance with the requirements of AS 5577. TransGrid's FSA applies a systematic process of comprehensively assessing network related safety risks in relation to the achievement of the primary objectives of the ENSMS.

TransGrid's FSAs are summarised below:

- **Bushfire Risk Management:** Considers network related bushfire risks. This includes the management of safety risks associated with bushfires in proximity to TransGrid's assets, as well as bushfires that may be ignited by TransGrid's activities and/or assets.
- **Public Electricity Safety:** Considers safety risks to the general public resulting from TransGrid's operations, including people working near TransGrid's network assets. This includes public safety aspects arising from the protection of the environment (excluding bushfire risk, which is addressed in a separate FSA).
- **Worker Health and Safety:** Considers safety risks to employees and contractors working on or near TransGrid's network. This includes worker health and safety aspects arising from the protection of the environment (excluding bushfire risk which is addressed in a separate FSA).
- **Network Reliability:** Considers safety risks arising from the loss of electricity supply, including network planning, continuity of electricity supply and physical security of assets.

The FSA and associated safety risks are reviewed and updated on an annual basis, or, as required in response to a serious network related safety incident. The FSAs demonstrate that the risks within the scope of the ENSMS are being managed to As Low As is Reasonably Practicable.

4. Safety risk management actions

TransGrid monitors all hazard or near miss incidents and actions from management reviews associated with various management systems in its Action and Risk Management System (ARMS).

The data presented in table 4 is derived from this application for the 2016 – 2017 reporting period as a summary of all relevant management system actions associated with the ENSMS. It includes tracking of a range of actions resulting from incident investigations, management and external audits and near misses.

Table 4 Risk management actions – open, completed and raised

Criteria	Number
Number of risk management actions within the ENSMS scope that were raised in the reporting year	Bushfire Risk Management = 2
	Generic Business Process covering multiple FSAs = 10
	Network Reliability = 10
	Public Electricity Safety = 7
	Worker Health and Safety = 167
Number of open safety risk management actions within the ENSMS scope from any reporting year	Bushfire Risk Management = 1
	Generic Business Process covering multiple FSAs = 0
	Network Reliability = 2
	Public Electricity Safety = 0
	Worker Health and Safety = 20
Percentage of safety risk management actions within the ENSMS scope completed by the due date within the reporting year	Bushfire Risk Management = 50%
	Generic Business Process covering multiple FSAs = 100%
	Network Reliability = 80%
	Public Electricity Safety = 100%
	Worker Health and Safety = 88%

All safety risk management actions outstanding by the due date in the reporting year noted above are opportunities for improvement or other low risk items from reliability investigations or management system audits.

5. Compliance with directions

Pursuant to Clause 13(2) of the ESSNM 2014 Regulation IPART (based on the EcoLogical Australia Pty Limited audit of TransGrid's safety management system) directed TransGrid to amend its safety management system in 2016 – 2017. This was detailed in the notice issued by IPART to TransGrid dated 5 August 2016 which listed 4 non-compliances against a range of requirements from the ESSNM 2014 Regulation and AS 5577 (as identified in Table 2 of this annual report). In the same notice, IPART broke down this direction into 3 discrete, scheduled and progressive steps to achieve full implementation of the amended management system throughout 2016 – 2017 and by 30 September 2017.

TransGrid also received a second notice issued by IPART on 16 February 2017 directing to modify the safety management system in relation to formal safety assessment of bushfire risks. This was a further notice supplementing the 5 August 2016 notice, i.e. it reiterates the same direction with 2 discrete, scheduled and progressive steps to achieve full implementation of the modified safety management system by 30 September 2017.

Table 5 Data on directions issued by IPART

Total number of directions issued by IPART	Total number of directions outstanding	Number of outstanding directions not complied with by the due date
3 [referring to the tasks listed in IPART notice dated 5 August 2016. This was reiterated in IPART notice dated 16 February 2017]	1 [referring to the final task listed in IPART notice which is due by 30 September 2017]	0 [referring to the 1st and 2nd tasks listed in IPART notice which were complied with during 2016 – 2017]

5.1 Outstanding directions not complied with

There are no outstanding directions as of 30 June 2017.

6. Statistical Reporting

6.1 Network asset failures

TransGrid relied upon its existing reporting process and associated asset type definitions consistent with the Australian Energy Regulator (AER) annual Regulatory Information Notice (RIN) reporting requirements to report the asset quantities and network asset failure statistics in Table 6, with one exception as noted below.

One asset type in the IPART Reporting Manual is not included in the RIN. The statistics for the secondary plant – substation battery are based on TransGrid's Enterprise Resource Planning (ERP) system Ellipse records and are counting both A and B systems individually.

TransGrid does not maintain a target functional failure rate metric for its network assets in its business practice and therefore is unable to report such a statistic in Table 6. TransGrid manages its assets to monitor and control the risk of failure (a function of both the failure rate and the consequence of failure) to an acceptable level rather than defining a target for functional failure rates.

A conditional failure is interpreted as those network assets which were replaced in 2016 – 2017 as part of TransGrid's replacement capital program.

TransGrid interprets the network asset functional failures to be the count of incidents when the particular network asset types were unable to meet the expected or specified performance standard in 2016 – 2017 period and thereby causing an outage and/or incident. No asset functional failures were defined as 'Assisted', i.e. due to the interaction of external objects or influences on the network structure/equipment that were beyond the control of TransGrid.

Table 6 Network asset failures

Asset type	Asset population or length	Target functional failure rate	Conditional failures past due in the reporting year	Functional failures			
				Unassisted		Assisted	
				No fire	Fire	No fire	Fire
Pole/tower	37,407	--	272	4	0	0	0
Conductor – Transmission / sub-transmission	11,351km (route length)	--	0.22km	1	0	0	0
Primary plant – power transformers	218	--	0	3	0	0	0
Primary plant – reactive plant	165	--	3	4	0	0	0
Primary plant – switchgear	12,801	--	113	25	2	0	0
Secondary plant – protection equipment	3,220	--	10	18	0	0	0

Asset type	Asset population or length	Target functional failure rate	Conditional failures past due in the reporting year	Functional failures			
				Unassisted		Assisted	
				No fire	Fire	No fire	Fire
Secondary plant - SCADA	1,829	--	0	0	0	0	0
Secondary plant – substation batteries	397	--	0	0	0	0	0

6.2 Encroachment on network assets

TransGrid has reviewed all the recorded work orders associated with vegetation encroachments raised during the 2016 – 2017 period to determine the number of times when the surrounding vegetation encroached its network assets. The results are presented in table 7 below. The overdue category 4 defects were scheduled for the next planned maintenance, but were reprioritised on a risk basis.

Table 7 Vegetation

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	8	5
Category 2 defects overdue	0	0
Category 3 defects overdue	0	0
Category 4 defects overdue	18	8
Total vegetation encroachments as a result of third parties	NA	NA

Clearance to ground has been interpreted as clearance to the natural ground level. TransGrid notes that it does not presently conduct any routine annual inspection of overhead spans specifically to identify ground clearance issues. Hence there is no planned inspection and defect data to report in Table 8 for 2016 – 2017 financial year. Over the last 10 years TransGrid has carried out a low span inspection program via Aerial Laser Survey to identify such violations, perform risk assessment and to prioritise corrective investment where applicable.

Table 8 Ground Clearance

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Number of OH spans for which inspections were planned	0	0
Number of OH spans for which inspections became overdue	0	0
Number of OH spans for which LIDAR inspections became overdue	0	0

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Number of defects identified	0	0
Number of defect rectifications that became overdue	0	0
Total ground clearance encroachments as a result of third parties	0	0

TransGrid maintains an easement encroachment register for the purpose of recording issues related to clearance to third party structures. These are recorded as field staff become aware of a potential issue through inspection. A total of 59 encroachment issues associated with clearance to third party structures were identified in 2016 – 2017.

None of the encroachments identified in Table 9 for the reporting period required action within IPARTs Category 1-4 definition. Each encroachment is assessed for risk and appropriate action taken with the landowner.

Table 9 Clearance to structures

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	0	0
Category 2 defects overdue	0	0
Category 3 & 4 defects overdue	0	0
Total structure clearance encroachments as a result of third parties	54	5

6.3 Unauthorised access to the network

A total of 6 incidents involving unauthorised access by members of the public to TransGrid network assets were recorded in 2016 – 2017.

TransGrid's security policy is based around the principles of deter, delay, detect and respond. A combination of CCTV and monitored intrusion detection, physical controls (security fence, restricted locks and keys, anti-tower climbing etc.) and other controls (signage, lighting, awareness) are selected for each site as appropriate to manage the risk of unauthorised entry.

Given the reliance on effective electronic monitoring and response, TransGrid does not conduct specific planned security inspections to identify unauthorised access to its network by its workers, contractors and members of public. Hence there is no data on number of planned security inspections, number of inspections that became overdue and the number of security inspections from any previous financial years that were still overdue as of 30 June 2017.

Table 10 Unauthorised access to the network

Criteria	Network Operator	Accredited Service Providers	General Public
Major substations and switching stations	0	0	4
Distribution substations, regulators, switches and associated equipment	NA	NA	NA
Electricity mains outside major substations	0	0	1
Communications equipment outside major substations	0	0	1

6.4 Customer Safety Reporting

This reporting is not applicable to TransGrid.

Table 11 Customer safety reporting

Criteria	Number
Number of customer shocks from installations caused by the ENO's electricity network	NA

6.5 ENO comments

TransGrid has no further comments for the 2016 – 2017 reporting period.